

# Fulgoridae of Madagascar: description of a new species representing a new genus, key to the genera and list of the species (Homoptera: Fulgoromorpha: Fulgoridae)

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## Abstract

A new Fulgoridae genus *Antsalovasia* n. g. is described for one Malagasy species, *A. hyalinipennis* n. sp.

A key to the genera of Fulgoridae occurring in Madagascar is provided together with the list of the species known from the island.

## Résumé

Un nouveau genre de Fulgoridae *Antsalovasia* n. g. est décrit sur base d'une espèce malgache, *A. hyalinipennis* n. sp.

Une clé des genres de Fulgoridae présents à Madagascar est proposée ainsi que la liste des espèces connues de l'île.

**Key words:** Madagascar, Fulgoridae, new genus, *Antsalovasia hyalinipennis* n.sp., identification key.

## 1. Introduction

The Malagasy fauna of Fulgoridae is not very rich, with hitherto only 16 species known from the island, representing 4 genera. Despite this relative poorness, there is a high degree of endemism with 3 of the 4 genera and 15 of the 16 species occurring only in Madagascar.

All those taxa have been keyed by LALLEMAND (1959) in a general revision of afrotropical fauna.

To date, nothing more has been published on Malagasy Fulgoridae. The fact that we have found a new genus and species in that fauna leads us to propose a key to the genera of Madagascar. We do not propose a key to the species because all the previously described genera are in need of revision.

A checklist of all known taxa present on the island is also provided and discussed.

## 2. Materials and methods

The material studied belongs to the institutions listed below (names of the responsables in charge of the collections in parentheses):

CAS – California Academy of Sciences, San Francisco, USA (Norman D. PENNY)

FSAG – Faculté des Sciences agronomiques de Gembloux, Gembloux, Belgium (Sébastien PATINY)

IRSNB – Royal Belgian Institute of Natural Sciences, Brussels, Belgium (Patrick GROOTAERT)

MNHN – Muséum national d'Histoire Naturelle, Paris, France (Thierry BOURGOIN)

MRAC – Musée royal de l'Afrique centrale, Tervuren, Belgium (Marc DE MEYER & Ugo DALL'ASTA)

The proposed key is based on that of LALLEMAND (1959). It has been validated with some species of each genus and for each genus the habitus of one representative species is illustrated.

The dissection of the males was proceeded as follows: the (part of) abdomen removed from the specimen was boiled in glacial acetic acid. The genital part was then removed and placed in tepid 10% KOH solution for some hours. The inflation of the penis was partly obtained after boiling in acetic acid and improved by putting it in lactic acid. Nevertheless, a perfect inflation of the penis seems difficult to obtain, especially with older specimens.

The distribution map was produced by the software *CFP* (BARBIER & RASMONT, 2000).

*Note:* for the Type material, each single label is transcribed between “ ”.

## 3. Taxonomic part

### *Antsalovasia* CONSTANT n.g.

Type species: *Antsalovasia hyalinipennis* CONSTANT n. sp.

**Etymology** – The name is derivated from Antsalova, the name of the district to which belongs the Antsingy Forest where the specimens have been collected.

**Diagnosis** – Immediately recognized among all Old World genera by the constriction between the head and pronotum, the lack of any frontal process and the mainly hyaline hindwings.

It shares only some very superficial similarities with some Australian genera e.g. *Desudaba* WALKER, 1858

and *Galela* DISTANT, 1906, but these are very different in the shape of the head, with the front projecting on the vertex.

**Description** – *Length*: medium sized Fulgorid (about 20–24 mm for the known species).

*Head*: much narrower than the pronotum and clearly separated from the latter; eyes big and protruding; vertex concave in dorsal view, about twice as broad as long, with the posterior margin conspicuously concave and the anterior one convex; front visible in dorsal view, separated from the vertex by only one transverse carina; front a little broader than long, with a strong transversal hump on the anterior part; three longitudinal carinae on the disc: the lateral ones oblique and the median one weakly marked; front concave between the lateral carina and the external edge; lateral margin of the front projecting at the middle as a lamina hiding the base of the antenna; clypeus longer than wide, not reaching the end of the procoxae; labium long and slender, with the second segment projecting beyond the metacoxae; ocelli positioned right under the eye; eyes oval in side view, projecting beyond the level of the vertex in frontal view; antennae with the scape short and the pedicel cylindrical.

*Thorax*: pro + mesonotum taken together as long as wide; anterior margin of the pronotum limited by a conspicuous, strongly sinuated, carina; pronotum much wider than long, with the anterior half clearly constricted (due to that anterior constriction, the sides of the prothorax are visible from above); posterior margin sinuated, concave in the middle and not carinated; median carina obsolete, blunt; mesonotum not carinated, with the disc flat and the sides clearly sinuated in the middle.

*Tegminae* elongated, about three times longer than broad, wider at the apex which is cut obliquely; costal margin straight, posterior margin sinuated; clavus open, claval veins fused, reaching the posterior margin of the tegmina at about the half of its length; apex of the tegmina hyaline.

*Hindwing* mainly hyaline.

*Legs* elongated, slender; no pad of setae on the tarsi of the hind legs; tibiae of the fore and middle legs with 2 longitudinal carinae on the external margin; hind tibiae with 4–6 lateral spines.

*Genitalia* of the normal fulgorid shape.

*Sexual dimorphism*: female a little bigger than the male.

*Distribution*: genus known only from Madagascar.

***Antsalovasia hyalinipennis* CONSTANT n. sp.**

Figs. 1a–g & 2 – Map 1

**Etymology** – *hyalin-* (from the Greek word *hualus* meaning glass) = transparent; *penna* (Latin) = wing. Named after the transparency of the hindwings.

**Examined material** – (2♂♂, 3♀♀) **Holotype** ♂ (*extremity of both fore legs and right hind leg missing*) [IRSNB]: “Andobo 190 m, forêt Antsingy, dct Antsalova, -II-57 P.

Griv.” “Coll. R.I.Sc.N.B., Madagascar” – **Allotype** ♀ (*extremity of the right leg broken, in a gelatine capsule*) [MNHN]: “MADAGASCAR Ouest, S-P. Antsalova, Antsingy, Rés. nat. 9, A. Peyrieras, I.1975” “Museum Paris” – 1 **Paratype** ♂ (*last segment of the left hind tarsus missing*) [MNHN]: “MADAGASCAR Ouest, S-P. Antsalova, Antsingy, Rés. nat. 9, A. Peyrieras, I.1975” “Museum Paris” – 1 **Paratype** ♀ [CAS]: “CASENT, 3005609” “Madagascar: Mahajanga prov: Parc National Tsingy de Bemahara, 3,4 km 93°E Bekopaka, Tombeau Vazimba, Elev 50m, 6–10 Nov. 2001” “19°8’31”S 44°49’41”E, coll: Fischer, Grifwold et al., California Acad. of Sciences, general collecting, tropical dry forest, coll. code: BLF4231” – 1 **Paratype** ♀ (*extremity of the tegminae and wings damaged*) [CAS]: “CASENT, 3005608” “Madagascar: Mahajanga prov: Parc National Tsingy de Bemahara, 2,5 km 62°ENE Bekopaka, Ankin-drodroa River, elev 100 m, 11–15 Nov. 2001” “19°7’56”S 44°48’53”E, coll: Fischer, Grifwold et al., California Acad. of Sciences, at light, tropical dry forest, on Tsingy, code:BLF4343”

**Diagnosis** – Only species of the genus. It has a conspicuous orange patch at the basis of the hindwing and black markings on the head and thorax.

**Description** – Body yellowish to orange with conspicuous black markings (Fig. 1a); total length: (♂) 20, (♀) 23,5 mm.

*Head* (Figs. 1b–c): 4 rounded spots on the vertex (2 big elevated ones on the disc, 2 smaller ones touching the foremargin and extending on the front); one big macula on the backside of the eye, extending under the eye; above the antenna, 2 transverse lines on the upper half of the front, connected by 3 lines along the carinae (these can extend and just leave 4 pale spots between the black lines); 2 spots at the basis of the clypeus, one at the apex.

*Prothorax* (Fig. 1d): 4 spots on the disc of the pronotum; 1 short line on the side behind the eye; 1 broad longitudinal stripe on the side, behind the antenna, with a narrow median longitudinal pale line.

*Mesonothorax*: 2 longitudinal stripes on the disc of the mesonotum with 2 longitudinal rows of 3 spots between them and 1 spot at the insertion of the tegula; 5 spots on each side of the ventral side; tegulae with the ventral half black.

*Tegmina*: rosy yellowish to orange with the apical third hyaline; the following are black: one short stripe at the basis, numerous dots on the disc and on the clavus, bigger spots on the hyaline part (with one curved stripe at the inner angle).

*Hindwing*: hyaline with an orange basal patch; veins black; posterior part of the anal zone lightly infuscated.

*Legs*: yellowish to pale orange with the following black markings: on the fore and median legs: one spot on the basis of the coxa, one on the basis of the femur, and one on the ventral side of the apex of the femur, a few little spots on the dorsal side; tibia with three rings, tarsi entirely black; hind legs with a small spot at the basis

of the femur and a bigger one at the apex of the ventral side of the latter; three spots on the dorsal side of the tibia; hind tarsus with the basis of the first segment, all the spines and the apical half of the last segment infuscated.

*Abdomen*: two rows of big black spots on tergites 3 to 7, one additional lateral spot on tergite 6; each sternite with two small black spots on the basal margin and another, bigger spot on each lateral margin

*Genitalia* ♂ (Figs. 1e-g): anal tube a little longer than broad, with the sides rounded in dorsal view; pygofer in lateral view higher than long, with the hind margin obtusely angled; in ventral view, a short median process on the hind margin; basis of the gonostyli fused; dorsal margin of the gonostyli bearing a strong tooth directed ventrad; penis bearing 2 pairs of sclerotized styles directed backwards; styles of the ventral pair bigger; each style prolonged by a membranous lobe directed backwards; laterobasally, another, bigger, membranous lobe projecting laterad on each side.

#### 4. Identification key to the genera of Fulgoridae of Madagascar

1. Head prolonged by an appendage . . . . . 2
  - Head without appendage . . . . . 4
2. Cephalic appendage directed horizontally; pronotum without median carina . . . . . *Zanna* KIRKALDY
  - Cephalic appendage oblique or vertically directed; pronotum with a median longitudinal carina . . . . . 3
3. Head narrow (vertex about as wide as an eye in dorsal view); apex of the forewing cut straight . . . . . *Cornelia* STÅL
  - Head wider (vertex about 2 times as wide as an eye in dorsal view); apex of the forewing rounded. . . . . *Belbina* STÅL
4. No constriction between the head and pronotum; hind wings coloured . . . . . *Radamana* DISTANT
  - Pronotum conspicuously constricted anteriorly; hind wings mainly hyaline. . . . . *Antsalovasia* CONSTANT

#### 5. List of the Fulgoridae species of Madagascar

Genus *Antsalovasia* CONSTANT n.g.  
(Fig. 2)

Type species: *Antsalovasia hyalinipennis* CONSTANT n. sp.

- *Antsalovasia hyalinipennis* CONSTANT, n. sp

Genus *Belbina* STÅL, 1863  
(Fig. 3)

Type species: *Belbina falleni* STÅL, 1863

- *Belbina blotei* LALLEMAND, 1959
- *Belbina falleni* STÅL, 1863
- *Belbina lambertoni* LALLEMAND, 1922
- *Belbina pionneau* LALLEMAND, 1922
- *Belbina recurva* LALLEMAND, 1950

- *Belbina servillei* (SPINOLA, 1839)
- *Belbina vicina* LALLEMAND, 1959

Genus *Cornelia* STÅL, 1866  
(Fig. 4)

Type species: *Cornelia nympa* STÅL, 1866

- *Cornelia atomaria* (BRANCSIK, 1893)
- *Cornelia bergrothi* SCHMIDT, 1911
- *Cornelia foliacea* LALLEMAND, 1950
- *Cornelia nympa* STÅL, 1866

Genus *Radamana* DISTANT, 1906  
(Fig. 5)

Type species: *Radamana varicolor* Distant, 1906

- *Radamana collarti* LALLEMAND, 1950
- *Radamana varicolor* DISTANT, 1906

Genus *Zanna* KIRKALDY, 1902  
(Fig. 6)

Type species: *Fulgora tenebrosa* Fabricius, 1775

- *Zanna pauliani* LALLEMAND, 1950
- *Zanna tenebrosa* (FABRICIUS, 1775)  
f. *madagascariensis* (SIGNORET, 1860)  
f. *nosibeana* LALLEMAND, 1959

**Incerta sedis** – *Aphana madagascariensis* WESTWOOD, 1851. This Malagasy species is placed by METCALF (1947) in his new genus *Aphaenina* METCALF, 1947.

LALLEMAND (1959) states that *Aphana madagascariensis* WESTWOOD, 1851 should be placed in either *Belbina* STÅL or *Cornelia* STÅL but the type of the species is lost and no identified specimen was available to him in any collection.

#### 6. Discussion

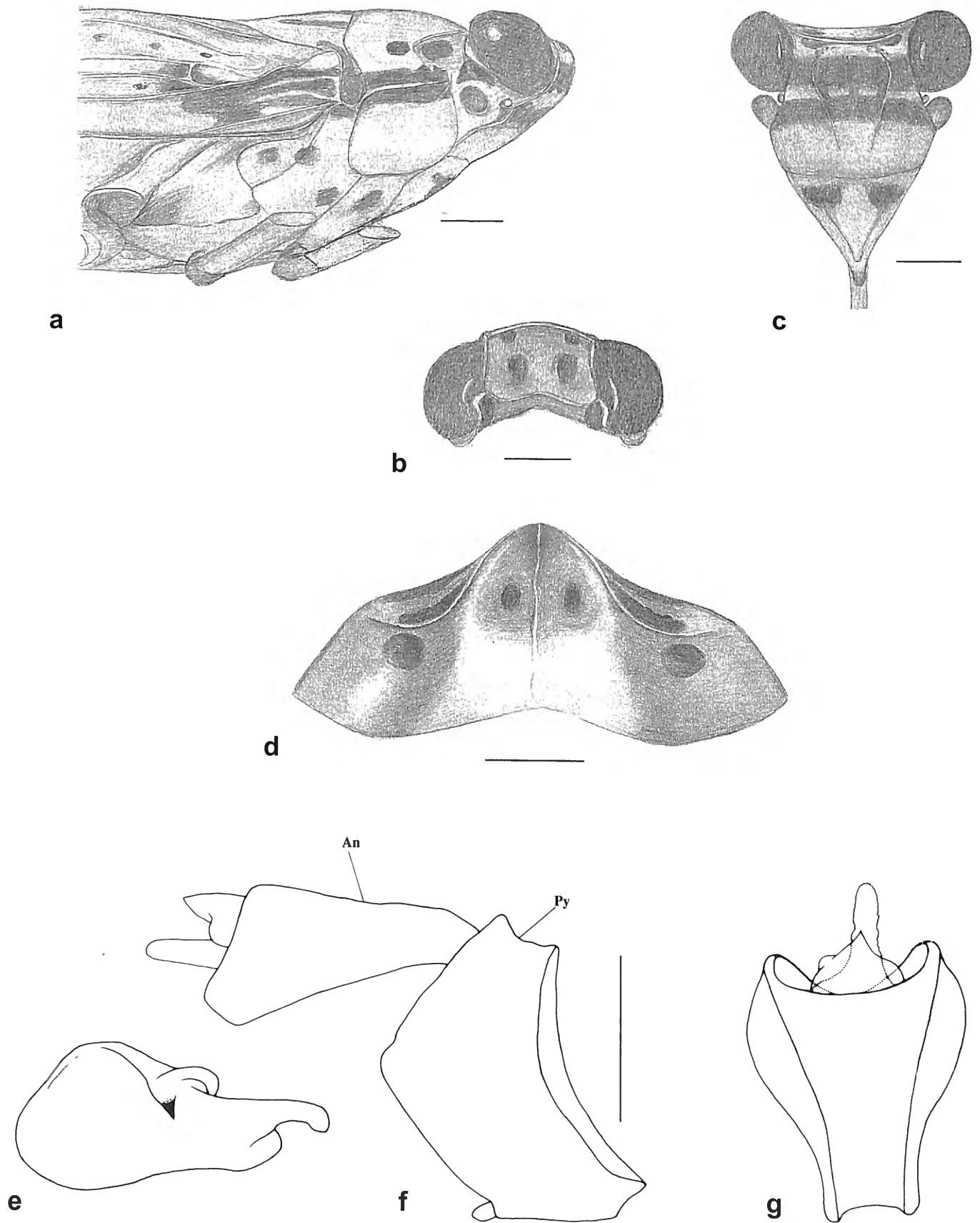
The study of the Malagasy fauna of Fulgoridae will surely lead to the discovery of other new taxa as large parts of the island (the Western half and the dry Southern part, especially) have been underprospected.

Moreover, an in-deep revision of the previously described taxa will have to be completed too. For that, the following points can already be emphasized.

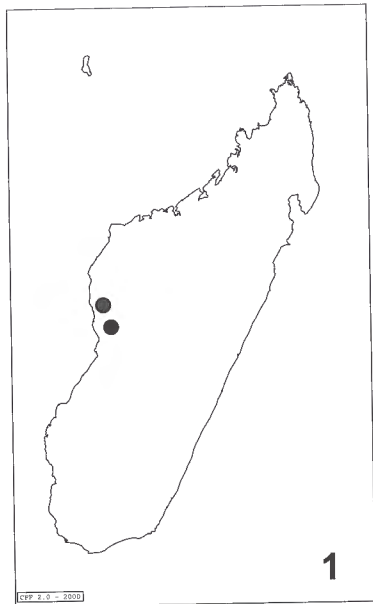
(a) LALLEMAND (1959) states that the type of *Belbina servillei* (SPINOLA) is lost and designates a lectotype in his collection [FSAG] that has no taxonomic value regarding the international code of zoological nomenclature. A neotype will have to be designated for that species unless the type of SPINOLA is found back.

(b) The genera *Belbina* STÅL, *Cornelia* STÅL and the afro-tropical *Druentia* STÅL are separated by external differences (STÅL, 1866; LALLEMAND, 1959) that seem very artificial and will have to be reconsidered.

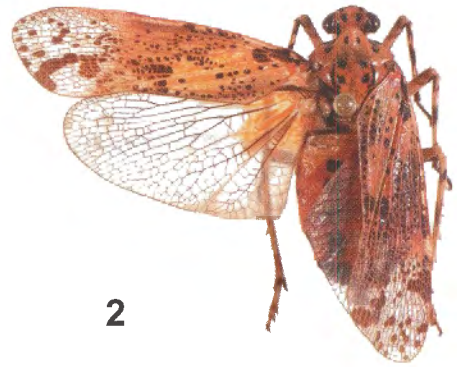
It is possible that they represent one single genus.



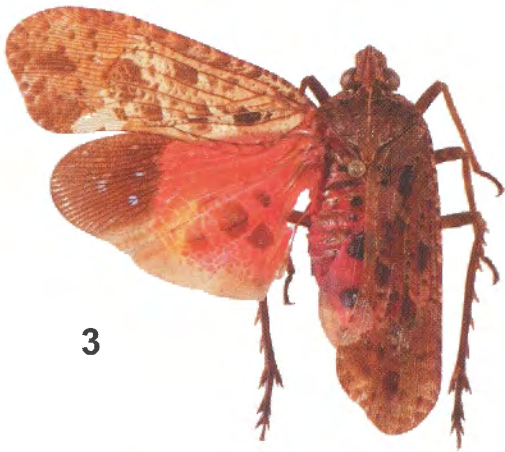
Figs. 1a-g — *Antsalovasia hyalinipennis* CONSTANT, n. sp. (holotype male). **a**, anterior part of the body: lateral view. **b**, head: dorsal view. **c**, head: frontal view. **d**, pronotum: dorsal view. **e**, right gonostyli: lateral view. **f**, pygofer and anal tube: right lateral view (An – anal tube; Py – pygofer). **g**, anal tube: dorsal view. Scale = 1 mm.



*Antsalovasia hyalinipennis* Constant



2



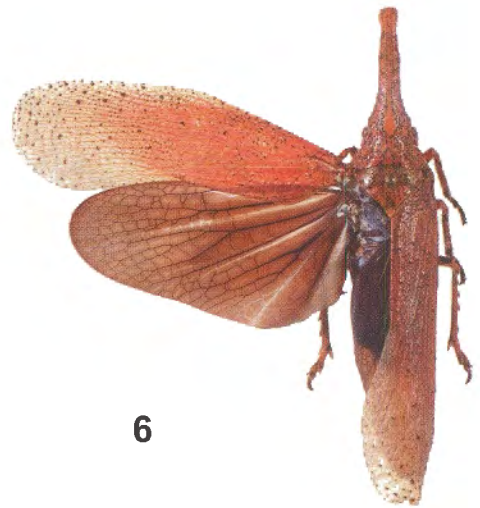
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4



5



6

Map 1 — Distribution of *Antsalovasia hyalinipennis* CONSTANT, n. sp.  
 Figs. 2-6 — Habitus of representative species of the Fulgoridae genera of Madagascar. 2, *Antsalovasia hyalinipennis* CONSTANT, n. sp. (female allotype – L = 23 mm). 3, *Belbina recurva* LALLEMAND (female – L = 28 mm). 4, *Cornelia nympha* STÅL (male – L = 20 mm). 5, *Radamana varicolor* DISTANT (female – L = 23 mm). 6, *Zanna tenebrosa* (FABRICIUS) (female – L = 54 mm).



(c) *Radamana varicolor* DISTANT and *R. collarti* LALLEMAND are probably conspecific.

(d) *Zanna* KIRKALDY is a complex genus that has to be revised with the use of some new characters, such as the presence of a pad of setae on the hind tarsomeres and the shape of the penis *inflated*, that could allow some natural divisions within the genus.

(e) The “forms” and subspecies described in the widely distributed, Afrotropical *Zanna tenebrosa* (F.) have probably little taxonomic value (if any).

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